

no. 303. Hartham, Rudloe, Spye Park, Wilts, C. E. Broome, Esq.

In the young plant the asci are precisely of the form of those of *Choiromyces mæandriiformis*, but with age they enlarge, and are at last obovate as in *Tuber æstivum*. Distinguished from the following by its smooth pale peridium, and the veins springing from a distinct, generally single basal point.

\*322. *Tuber rufum*, Pico, Vitt. l. c. p. 48. Rudloe, Wilts, C. E. Broome, Esq.; Audley End, Essex, Rev. J. E. Leefe.

[To be continued.]

XLIII.—On the Family Procellariidæ, with descriptions of Ten new Species. By JOHN GOULD, F.R.S. &c.

To Richard Taylor, Esq.

DEAR SIR,

THERE is perhaps no group of birds respecting which so much confusion exists, and the extent of whose range over the surface of the ocean is so little known, as that forming the family *Procellariidæ*; it may not, therefore, be uninteresting to ornithologists if I furnish you with some observations on and a short account of those species contained in my own collection, which in nearly every instance were procured during my voyage to and return from Australia. I have endeavoured wherever possible to identify them with those described by Forster, Banks, &c., whose drawings and descriptions have been consulted for the purpose; I must observe, however, that the descriptions of Latham and the older authors are in most instances so meagre and confused, that it is quite impossible to decide in every case to which species they have reference, and hence I have been induced in some cases to give new specific appellations to birds which may have been described by them, but which it is impossible, for the reasons above given, to identify.

I am, Dear Sir, your obedient servant,

April 17th, 1844.

JOHN GOULD.

*Diomedea exulans*, Linn.—This species is very numerous between the 30th and 60th degrees of S. lat., and is to be met with in every part of the circle encompassing the world bounded by those degrees; its range, however, extends much farther south, even to within the Antarctic circle.

*Diomedea cauta*, Gould, Proc. of Zool. Soc. part 8. p. 177.—Very abundant off the southern coast of Van Diemen's Land. I shot several specimens in the neighbourhood of the whaling station in Recherche Bay, where they were feeding upon the offal of dead Cetaceæ.

*Diomedea culminata*, Gould in Proc. of Zool. Soc.—Rather abundant both in the Pacific and Atlantic oceans, between the 30th and 50th degrees of S. lat.

*Diomedea chlororhynchos*, Lath.—I observed this bird both in the Atlantic and Pacific oceans, between the 30th and 60th degrees of S. lat.

*Diomedea melanophrys*, Temm.—The most abundant species of the southern seas, being equally numerous in every part between the 30th and 60th degrees of S. lat.

*Diomedea fuliginosa*, Gmel. (*Diomedea fusca*, Audubon, Birds of Am. pl. 407.)—This species is also to be met with in every part of the ocean between the 30th and 60th degrees of S. lat., and is equally common off the coast of Van Diemen's Land, Cape Horn and the Cape of Good Hope.

*Diomedea gibbosa*, n. sp.—Face, ear-coverts, chin, abdomen, upper and under tail-coverts white; the remainder of the plumage very dark brown, approaching on the occiput, back of the neck and wings to black; bill yellowish horn-colour, becoming darker at the tip and at the base; feet in the specimen dark brown, but doubtless of a bluish gray, inclining to flesh-colour in the living bird.

Total length 30 inches; bill 4; wing 21; tail 7; tarsi 4.

The above is the description of a new species in the collection of the Zoological Society of London, to whom it was presented by F. Debell Bennett, Esq., who had procured it in the North Pacific. It differs from every other that has come under my notice in the peculiar swollen and raised form of the base of the upper mandible, which moreover rises high upon the forehead.

*Diomedea olivaceorhyncha*, n. sp.—I propose this name for a species, examples of which are wanting to our collections, and of which a bill only has as yet come under my notice. In all probability it will prove to be most nearly allied to *Diomedea chlororhyncha*, and in size less than any other species yet discovered. The bill, which is in the possession of Sir Wm. Jardine, Bart., is 3 inches and  $\frac{5}{8}$ ths long from the gape to the tip, is of a uniform olive-green, and in form is more slender and elegant than that of the other members of the genus. The locality in which it was procured is not known, but it is supposed to have been obtained in the China seas.

The foregoing list comprises all the species of Albatros known, with the exception of the *Diomedea brachyura* of M. Temminck, which is an inhabitant of the North Pacific ocean. There is, however, another bird in the Royal Museum at Berlin, which is said to be the young of *D. brachyura*, but which, as it differs considerably in structure, may prove to be another and entirely distinct species from those above enumerated. It is of a uniform

dark chocolate colour, and has the bill and legs more slender than *D. brachyura*; the label attached to it was inscribed "*Diomedea brachyura*, Buff.—963?" It had been sent to the Berlin Museum by M. Brandt of St. Petersburg, and had been collected by Kittitz on the western coast of America.

*Procellaria gigantea*, Gmel. (Large Black Petrel).—Very common between the 35th and 55th degrees of S. lat., particularly at the Cape of Good Hope, Van Diemen's Land and Cape Horn. It is the largest member of the genus.

*Procellaria æquinoctialis*, Linn. (White-throated Black Petrel).—From what I have observed of this species, it would appear to be more abundant off the Cape of Good Hope than elsewhere; it is also to be met with, but more sparingly, off the coasts of Australia, and in all probability, like most of the other members of the genus, it makes a circuit of the globe.

I have some specimens in my possession of a petrel which I observed to be very abundant in the Atlantic and Pacific, and which have a broad stripe of white crossing the forehead, passing down before and beneath the eye, and then turning upwards nearly meeting at the occiput, the bill short and compact, and the middle toe and interdigital membranes quite black: in consequence of these differences, I had intended to characterize these birds as distinct from *P. æquinoctialis* under the name of *P. conspicillata* from the white markings of the head; but upon reconsideration, I think it best to refrain from so doing until I have had further opportunities for observation and of examining other specimens; in the event of their proving to be distinct, the name I have proposed may not be deemed inappropriate.

*Procellaria Atlantica* (Black Petrel), n. sp.—Male: the whole of the plumage deep chocolate-black; bill and feet jet-black.

Total length  $15\frac{1}{4}$  inches; bill  $1\frac{5}{8}$ ; wing  $11\frac{1}{2}$ ; tail, cuneiform, 5; tarsi  $2\frac{5}{8}$ ; middle toe and nail  $2\frac{3}{8}$ .

This is one of the commonest species inhabiting the Atlantic, and no ship passes between our shores and the Cape of Good Hope without encountering it; it is a species respecting which very considerable confusion exists in the writings of nearly all the older authors. It is the *P. fuliginosa* of Forster's Drawings, no. 93 B, and the *P. fuliginosa* of Lichtenstein's edition of Forster's MSS. p. 23, which term cannot be retained, as it had already been applied by Latham to a very different bird from Otaheite; it is the *P. grisea* of Kuhl but not of Linnæus, who has applied the term to another species, consequently *grisea* cannot be retained for it; and hence I have been induced to give it a new appellation, and thereby prevent misapprehension for the future.

*Procellaria macroptera*, Smith? (Gray-faced Black Petrel).—I think that a bird I killed in the seas off Van Diemen's Land,



where it was tolerably abundant, and which differs from the last in being of a larger size, having much longer wings and a grayer face, may be identical with the *P. macroptera* of Smith, and I therefore retain it under that appellation with a mark of doubt, in preference to assigning it a new name.

*Procellaria Solandri*, Gould in Proc. of Zool. Soc. March 26, 1844 (Robust Black Petrel), n. sp.—Head, back of the neck, shoulders, primaries and tail dark brown; back, wing-coverts and upper tail-coverts slate-gray, each feather margined with dark brown; face and all the under surface brown, washed with gray on the abdomen; bill, tarsi, toes and membranes black.

Total length 16 inches; bill  $1\frac{3}{4}$ ; wing 12; tail  $5\frac{1}{2}$ ; tarsi  $\frac{5}{4}$ ; middle toe and nail  $2\frac{3}{8}$ .

This is a remarkably robust and compact bird. I shot a single individual in Bass's Straits on the 13th of March 1839. M. Natterer thought that it might possibly be identical with the bird figured in Banks's drawings, and to which Dr. Solander has affixed the term *melanopus*, an opinion in which I cannot concur; I have therefore named it in honour of that celebrated botanist. The specimen above described may possibly prove to be not fully adult, as the dark colouring of the under surface only occupies the extreme tips of the feathers, the basal portions of which are snow-white.

*Procellaria leucocephala*, Forster.—This very fine species inhabits all the Australian seas, and doubtless, from its great powers of flight, extends its range round the world. I observed it in nearly all parts of the ocean from the Cape of Good Hope to Van Diemen's Land; it is a most conspicuous bird when on the wing, but is so shy and wary that it is all but impossible to procure specimens, even though a boat be lowered for the purpose. A single specimen only graces my collection, which I shot during my passage from Van Diemen's Land to Sydney, Feb. 20, 1839.

*Procellaria mollis*, n. sp.—Adult. Crown of the head and all the upper surface slate-gray, the feathers of the forehead margined with white; wings dark brown; before and beneath the eye a mark of brownish black; face, throat and all the under surface pure white, interrupted by the slate-gray of the upper surface advancing upon the sides of the chest, and forming a faint band across the breast; centre tail-feathers dark gray; outer feathers grayish white, freckled with dark gray; bill black; tarsi, base of the toes, and basal half of the inner interdigital membrane pale fleshy white.

Total length  $13\frac{1}{2}$  inches; bill  $1\frac{1}{8}$ ; wing  $9\frac{3}{4}$ ; tail, cuneiform, 5; tarsi  $1\frac{5}{8}$ ; middle toe and nail  $1\frac{7}{8}$ .

The young differs in having all the under surface dark gray, and the throat freckled with gray.

This is one of the commonest birds inhabiting the South Atlantic, and must have been observed by every one who has crossed the line, yet strange to say, I find no description in any of the older writers to which it can be referred with certainty; in which opinion my lamented friend, M. John Natterer of Vienna, who had paid great attention to the members of this group, coincided. The following note was attached to my specimen by him when last in England:—"The *Procellaria lugens* of Banks's drawings, no. 22?; *Procellaria grisea*, Kuhl (not of Gmel.), pl. 11. fig. 9; does not agree with Banks's drawings, but agrees with Kuhl's *grisea*. A new name is certainly requisite, if no other can be found."

It is very abundant from the 20th to the 40th degrees of S. lat. The term *mollis* has been suggested by the peculiar character of the under plumage, which is much more dense and soft than that of most other members of the group.

*Procellaria leucoptera*, Gould in Proc. of Zool. Soc. March 26, 1844, n. sp.—Crown of the head, all the upper surface and wings dark slaty black; tail slate-gray; greater wing-coverts slightly fringed with white; face, throat, all the under surface, the base of the inner webs of the primaries and secondaries, and a line along the inner edge of the shoulder pure white; bill black; tarsus and basal half of the interdigital membrane fleshy white; remainder of toes and interdigital membrane black.

Total length 13 inches; bill 1; wing  $8\frac{1}{2}$ ; tail 4; tarsi  $1\frac{1}{8}$ ; middle toe and nail  $1\frac{3}{8}$ .

Nearly allied to *P. mollis*, but much smaller in size, and differs also in the white line along the under surface of the wing, formed by the white basal halves of the feathers. It breeds in great numbers on Cabbage-tree Island, at the mouth of Port Stephen's Harbour, New South Wales, and is very abundant in all parts of the ocean between that locality and New Zealand.

*Procellaria carulea*, Gmel.—This bird may be distinguished when on the wing from every other of the smaller Petrels by the conspicuous white tips of the centre tail-feathers. It is a very powerful flier, and I observed it in every part of the ocean I traversed between the 40th and 55th degrees of S. lat., both in the Atlantic and Pacific.

As much confusion exists with respect to this species, I beg to state that it is the *Procellaria similis* of Forster's Drawings, no. 86, and of Lichtenstein's edition of Forster's MSS. p. 59; the *Procellaria carulea* of Gmelin, Latham and Kuhl, and the *P. Forsteri* of Smith but not of Latham.

*Procellaria hesitata*, Kuhl. Forster's Drawings, no. 92.—This is also a most powerful bird on the wing, and in its passage over the ocean mounts higher in the air than most other members of the group. It enjoys so wide a range of habitat, that it may be said

to be universally diffused between the 30th and 55th degrees of S. lat.

*Procellaria flavirostris*, n. sp.—Feathers of the head and all the upper surface brown with paler edges, fading into white on the tips of the upper tail-coverts; wings and tail deep blackish brown; all the under surface pure white; the feathers of the under surface of the shoulder with a streak of brown down the centre; bill yellow, passing into dark horn-colour at the tip; tarsi and feet fleshy white.

Total length 19 inches; bill  $2\frac{3}{4}$ ; wing 15; tail  $6\frac{1}{2}$ ; tarsi  $2\frac{3}{8}$ ; middle toe and nail  $3\frac{1}{8}$ .

This fine species was procured off the Cape of Good Hope, in lat.  $36^{\circ} 39'$  S., long.  $10^{\circ} 3'$  E., by His Excellency Governor Grey, on his passage to South Australia. It is distinguished from its congeners by its much larger size, and by the yellow colouring of the bill. The female is somewhat smaller than her mate.

This bird so nearly approaches in form the members of the genus *Puffinus*, that it is almost questionable whether it should not be included in that group.

*Procellaria Antarctica*, Gmel.—Inhabits the whole of the frozen regions of the Antarctic circle, out of which it is rarely to be met with.

*Procellaria Glacialoides*, Smith.—Abundant between the 30th and 50th degrees of S. lat. I have a specimen killed at New Zealand, and I observed it to increase in numbers as we approached Cape Horn; it is also equally abundant off the Cape of Good Hope. I caught many of this species with the hook and line.

*Procellaria nivea*, Gmel.—An inhabitant of the icy regions of the Antarctic circle. My specimens differ so much in size as to suggest the idea that there may be more than one species of these snow-white Petrels.

*Puffinus brevicaudus*, n. sp.—Found in all the Australian seas, and breeds in the greatest abundance on several of the islands in Bass's Straits.

*Puffinus carneipes*, Gould in Proc. of Zool. Soc. March 26, 1844, n. sp.—The whole of the plumage chocolate-black; bill fleshy white; the culmen and tips of the mandibles brown; legs, feet and membranes yellowish flesh-colour.

Total length 15 inches; bill  $1\frac{3}{4}$ ; wing 12; tail 5; tarsi 2; middle toe and nail  $2\frac{1}{2}$ .

Numerous on the seas bounding the western coast of Australia, and breeding on the small islands off Cape Leeuwin, where my specimens were procured.

*Puffinus sphenurus*, n. sp.—All the upper surface dark chocolate-brown, which gradually deepens into black on the primaries



and tail; feathers of the scapularies, which are very broad in form, washed with lighter brown at their tips; face and throat dark brownish gray, the remainder of the under surface grayish brown; bill reddish fleshy brown, darker on the culmen and tip; legs and feet yellowish flesh-colour.

Total length  $15\frac{1}{2}$  inches; bill  $1\frac{5}{8}$ ; wing  $11\frac{1}{2}$ ; tail 6; tarsi  $1\frac{7}{8}$ ; middle toe and nail  $2\frac{3}{8}$ .

This species was procured by Mr. Gilbert on the Houtmann's Abrolhos off the western coast of Australia. Both this and *P. carneipes* agree tolerably well with Lesson's *P. chlororhynchus*; but as the members of this group are very numerous, and his description, which is far too concise, applies equally well to both, it is impossible to say whether it has reference to either of them or to some other.

*Puffinus assimilis*, Gould, Proc. of Zool. Soc. part 5. p. 156.—Found on the seas bounding the eastern coast of Australia, and on Norfolk Island, where it breeds.

*Puffinuria Urinatrix*.—Very numerous in the seas adjacent to the coasts of Van Diemen's Land and New Zealand. Specimens brought home by Captains King and Fitzroy from the Straits of Magellan do not differ from those obtained in the localities above mentioned.

*Daption Capensis*, Steph.—Found in all parts of the ocean round the globe from the 15th to the 55th degrees of S. lat.

*Prion vittatus*, Cuv.—Very common off Kerguelen's Land and in all the seas to the southward of Australia.

*Prion Banksii* (*Pachyptila Banksii*, Smith).—Found in the temperate latitudes of the Atlantic and Pacific, and I believe in similar latitudes all round the globe.

*Prion Turtur* (*Procellaria Turtur*, Kuhl, and of Banks's drawings).—This species differs from the last in the delicate blue of the upper surface, in the narrower form of the bill, and in the laminæ being scarcely visible. I have shot it in company with *P. Banksii*, and it appears to enjoy a similar range of habitat, being equally numerous in the temperate latitudes of the Pacific and of the Atlantic.

*Prion Ariel*, Gould, Proc. of Zool. Soc.—I killed this species in Bass's Straits, where it was rather numerous.

*Thalassidroma tropica*, n. sp.—Head, back, wings, tail and breast dark sooty black; chin, under coverts of the wings, abdomen, flanks, under tail-coverts, and a broad crescent-shaped band across the upper tail-coverts snow-white; bill, feet and legs black.

Total length  $7\frac{3}{4}$  inches; bill  $\frac{7}{8}$ ; wing  $6\frac{1}{2}$ ; tail  $3\frac{1}{2}$ ; tarsi  $1\frac{3}{4}$ ; middle toe and nail  $1\frac{1}{4}$ .

I observed this species in the Atlantic, where it is confined to the equatorial regions, being most abundant in the vicinity of the

line. It is the largest member of the genus with which I am acquainted, and is rendered very conspicuous by the white mark on its throat.

*Thalassidroma marina*, Less.—Very common in all the Australian seas. The specimens in my possession were found breeding and procured on the islands near Augusta, on the western coast of Australia.

*Thalassidroma Wilsoni*, Bonap.—After a careful examination of numerous specimens from the Australian seas with others taken in the North Atlantic, I cannot come to any other conclusion than that they are identical; an anomalous fact, since it is the only species with which I am acquainted that frequents the seas on both sides of the equator.

I met with it in considerable numbers in Bass's Straits, and observed it in every degree of temperate latitude.

*Thalassidroma Nereis*, Gould, Proc. of Zool. Soc. part 8. p.178.—I have never seen this highly interesting species in any other parts of the ocean than Bass's Straits and the seas washing the southern shores of Australia.

*Thalassidroma melanogaster*, n. sp.—All the plumage deep sooty black, with the exception of the upper tail-coverts and flanks, which are snow-white; bill, legs and feet black.

Total length  $7\frac{1}{2}$  inches; bill  $\frac{5}{4}$ ; wing 6; tail 3; tarsi  $1\frac{5}{8}$ ; middle toe and nail  $1\frac{1}{4}$ .

This species is very abundant in the South Pacific and Indian oceans, particularly off the islands of St. Paul's and Amsterdam. I also met with it midway between those islands and Van Diemen's Land. It is a species which cannot be mistaken at sea, from the black mark which occupies the centre of the abdomen, and contrasts so strongly with the white flanks.

*Thalassidroma leucogaster*, n. sp.—Head and neck deep sooty black; back grayish black, each feather margined with white; wings and tail black; chest and all the under surface and upper tail-coverts pure white; bill and feet jet-black.

Total length  $7\frac{1}{4}$  inches; bill  $\frac{5}{4}$ ; wing 6; tail 3; tarsi  $1\frac{1}{2}$ ; middle toe and nail 1.

This bird was killed in  $36^{\circ}$  S. lat.,  $6^{\circ} 47'$  E. long., by His Excellency Governor Grey.

I have a small petrel presented to me by Mr. Denison, who killed it near the coast of Australia on his passage to Sydney, in which the nostril-tube is much more lengthened than in any other species, and its apical portion turned upwards or recurved, instead of being attached to the bill throughout its entire length as in the other members of the genus. In the distribution of its colouring it is very nearly allied to *T. tropica* and *T. leucogaster*, and it may be a mere variety of one or other of those species;



but the bill, in addition to the feature pointed out above, is of a more slender and attenuated form than is observable in any other.

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XLIV.—*On the Plurality and Development of the Embryos in the Seeds of Coniferæ.* By ROBERT BROWN, Esq., F.R.S., F.L.S., and Foreign Member of the Academy of Sciences in the Institute of France\*.

[With a Plate.]

THE following short paper on a subject which I intend to treat at greater length, contains a few facts of sufficient interest perhaps to admit of its being received as a communication to the present meeting.

In my observations on the structure of the female flower in *Cycadeæ* and *Coniferæ*, published in 1826†, I endeavoured to prove that in these two families of plants the ovulum was in no stage inclosed in an ovarium, but was exposed directly to the action of the pollen.

In support of this opinion, which has since been generally, though I believe not universally adopted, the exact resemblance between the organ until then termed ovarium in these two families, and the ovulum in other phænogamous plants, was particularly insisted on; and I at the same time referred, though with less confidence, to their agreement in the more important changes consequent to fecundation.

I noticed also the singular fact of the constant plurality of embryos in the impregnated ovula of *Cycadeæ*, and the not unfrequent occurrence of a similar structure in *Coniferæ*. In continuing this investigation, in the course of the same summer in which the essay referred to appeared, it seemed probable, from the examination of several species of the Linnæan genus *Pinus*, namely, *Pinus Abies*, *Strobus* and *Larix*, that the plurality and regular arrangement of embryos were as constant in *Coniferæ* as in *Cycadeæ*; for in all the species of *Pinus* here referred to, the preparation for the production of several embryos was equally manifest, and the points or areolæ of production were in like manner disposed in a single circular series at the upper extremity of the amnios.

From these observations, which I have since confirmed in the same and also in other species of *Pinus*, an additional and important point of resemblance is established between *Cycadeæ* and

\* Read before the British Association at Edinburgh in August 1834, and published in the *Annales des Sciences Naturelles* for October 1843.

† In the Appendix to Capt. King's Voyage.